(1) Claims 16-17, 19-24, 30-34, 36-38 over U.S. 5,777,779 (Hashimoto et al) in view of U.S. 6,366,013 (Leenders et al), and in view of either one of U.S. 6,040,939 (Demiryont et al), U.S. 6,379,788 (Choi et al), U.S. 5,780,160 (Allemand et al), or U.S. 5,805,330 (Byker);

(2) Claims 25-26 over the above combination of prior art in (1), and further in view of U.S. 5,800,918 (Chartier et al); and

(3) Claims 27-29 over the above combination of prior art in (1), and further in view of U.S. 6,632,121 (Chopin et al),

are all respectfully traversed.

As recited in independent Claim 16, the invention is a glazing comprising (a) at least one electrically controllable system having variable optical and/or energy properties, (b) at least one coating for adjusting the optical appearance conferred on the said glazing by the said system, said at least one coating having antireflection properties in the visible, wherein said coating having antireflection properties is deposited on at least one of the external faces of said glazing and comprises a stack of thin layers having alternately high and low reflective indices or a graded-refractive-index layer, and (c) at least one coating for attenuating/modifying the color of the glazing in reflection, wherein component (c) acts to lower C* saturation values in the (L, a*, b*) colorimetry system of the glazing in reflection.

When both the antireflection and attenuating/modifying coatings are present, superior results are obtained, which are unobtainable without both layers, or without the antireflection coating. This superiority is demonstrated in the comparative data of record, and particularly, in Examples 3 and 4, described in the specification beginning at page 18, line 37. Better filtering properties toward heat rays, higher TL values in the bleached state (with a TL that can reach 80%, which is a real achievement for an electrochromic glazing, because the electrochromic layers, even in the bleached state, do remain a little bit absorbing). So, the

anti-reflecting stack of thin layers acts in synergy with the electrochromic system, thermally **and** optically, both in the colored and uncolored state of the electrochromic system, which combination of both thermal and optical effects could not have been predicted.

Example 3 is according to the claimed invention; Example 4 contains no antireflection coating. As disclosed in the specification beginning at page 19, line 28, the optical properties of the glazing were improved when at least one coating attenuating the color or an antireflection coating was provided, but the maximum improvement was obtained by using both types of coating together. The following optical properties in the bleached state (+1.2 V supply), and in the colored state (-1.6 V supply) were compared for Examples 3 and 4:

light transmission T_L (%);

values of a_{TL}* and b_{TL}* in the (L*, a*, b*) system in transmission;

light reflection R_{L1} on the "internal side" and the corresponding a* and b* values;

light reflection R_{L2} on the "external side" and the corresponding a* and b* values;

energy transmission T_E (%);

energy reflection R_{E1} (on the external side);

energy reflection R_{E2} (on the internal side), and

solar factor SF (the solar factor is the ratio between the total energy entering the room through the glazing to the incident solar energy).

This data is shown in the specification at (corrected) Table 1 and Table 2 at page 21, and at page 22, lines 1-8, wherein for Example 3, the SF is 33% in the coloured state (-1.6 V) and 73% in the bleached state (+1.2 V); and for Example 4, the SF is 32% in the coloured state and 67% in the bleached state.

As disclosed in the specification at page 22, lines 9-24:

It may be seen from this data that, in the case of Example 3 according to the invention, it is possible to achieve a wider light transmission range and, in particular, to achieve a T_L of almost 80% in the bleached state. The energy transmission in the bleached state of Example 3 is also lower than that of Example 4 and the energy reflections are higher, whether in the coloured sate or in the bleached state. Example 4, which has only the anti-colour coating, already shows an improvement over standard electrochromic glazing, especially with regard to R_{L1} and R_{L2} colorimetry in reflection. But Example 3, in which an antireflection coating has been added, allows the T_L range to be broadened towards higher values and allows the glazing to be made more effective from the standpoint of the filtration of thermal, especially solar, radiation.

The presently-claimed subject matter is neither disclosed nor suggested by the applied prior art.

Hashimoto et al is drawn to an electrochromic device which, as noted by the Examiner, may contain an anti-reflection coating in the form of multi-layers composed of a plurality of different kinds of monolayers on an exposed surface of the substrate for the electrochromic device (column 3, lines 2-7).

Leenders et al discloses an anti-reflection coating, which may be a stack of layers having alternatively very low and very high refractive indices (column 7, line 40 - column 8, line 10), for reducing the reflection of information displays such as electrochromic displays (column 10, line 63).

The Examiner relies alternatively on Demiryont et al, Choi et al, Allemand et al, and Byker et al, as meeting the terms of the presently-recited at least one coating for attenuating/modifying the color of the glazing in reflection. Demiryont et al disclose an anti-solar, low-emissivity functioning multi-layer coating on a transparent substrate, wherein the substrate may be an electrochromic device (column 6, line 18), which multi-layer coating, as shown in Fig. 2 and disclosed at column 7, line 36 ff, may contain a color control layer between the substrate and a first anti-reflecting coating. Demiryont et al discloses that the color control layer is preferably formed of silicon or tungsten metal, and its purpose is to

achieve both enhanced uniformity and desired hue or color of the coated article, wherein uniformity of color refers to reduction in blotchiness or the like which may otherwise appear in a coated article (column 7, lines 36-52). Choi et al discloses an anti-reflection film wherein, in an embodiment for so-called "flat screen" cathode ray tubes, dark screen color is provided by applying to the glass of the screen an anti-reflection film having at least one colored layer therein, wherein the colored layer may be separate from all the other layers of the film and serves solely to provide the necessary tint (paragraph bridging columns 7 and 8). Allemand et al disclose an electrochromic device sandwiched between two transparent substrates, which substrates may have a coating on the outward facing surface, which may be, *inter alia*, an anti-reflection coating and a colored coating (column 7, lines 48-59). Byker et al disclose an electro-optic window incorporating a discrete photovoltaic device, which may contain an optional layer, such as a layer of, *inter alia*, an anti-reflection and/or a color suppression material or materials deposited between a transparent conductive material **16** and front glass rear face **12**b and/or between transparent conductive material **18** and rear glass front face **14**a to suppress or filter out any unwanted portion of the electromagnetic spectrum (column 5, lines 61-67).

Chartier et al discloses a multi-layered hydrophobic window glass comprising one or more layers and a hydrophobic-oleophobic, abrasion-resistant coating which may include a layer of hydrolyzable fluorinated alkylsilanes.

Chopin et al discloses a substrate coated with a coating having a photocatalytic property based on titanium dioxide at least partially crystallized in the anatase form.

The fundamental flaw in all of the above rejections is that none of Demiryont et al, Choi et al, Allemand et al, and Byker et al disclose a coating for attenuating/modifying the color of the glazing in reflection, as that term would be understood from the disclosure, and

as now recited in independent Claim 16. This layer has a function different from the color control layer of Demiryont et al, different from the colored layer of Choi et al, and different from the colored layer of Allemand et al. Furthermore, while it is not clear from Byker et al precisely how their color suppression layer functions, nevertheless, Byker et al require that their anti-reflection layer, if present, be at a location **within** their electro-optic window, rather than on an external face thereof, as required by the present claims. Thus, if one skilled were to combine Byker et al with Hashimoto et al and Leenders et al, even if there was some overlap between present component (c) and Byker et al's color suppression layer, the result would not be the presently-claimed invention.

Neither Chartier et al nor Chopin et al remedy any of the deficiencies of rejection (1), since neither disclose or suggest the glazing of Claims 16.

Claims 19-20 are separately patentable. The Examiner relies on Hashimoto et al's disclosure of a layer of yttrium oxide (column 3, lines 48-55). But this layer is part of mixture layer 4, which is part of the electrochromic device, therein. None of the applied prior art discloses or suggests yttrium oxide as part of coating (c) herein.

Claims 23-24 are separately patentable because, contrary to the finding by the Examiner, the first conductive layer and second conductive layer of Hashimoto et al are not analogous to the carrier substrate and primer/tie-layer coating of these claims.

In the present Office Action, the Examiner ignores the above arguments that none of Demiryont et al, Choi et al, Allemand et al and Byker et al disclose a coating for attenuating/modifying the color of the glazing in reflection, as that term would be understood from the disclosure, nor the argument regarding separate patentability of Claims 19-20 and 23-24. The Office Action is thus incomplete, and thus does not comply with 37 C.F.R. § 1.104(b). If the present response does not put this application in condition for allowance,

then the next Office communication should be a new Office Action, responding to all of Applicants' arguments, and not an Advisory Action.

For all the above reasons, it is respectfully requested that the rejections over prior art be withdrawn.

The rejection of Claims 16, 18, 25, 27, 30-31, and 35 under 35 U.S.C. § 112, second paragraph, is respectfully traversed. The claims are not indefinite simply because certain components may be recited in functional terms. The specification clearly enables persons skilled in the art to choose, for example, electrically controllable systems, coatings for adjusting the optical appearance conferred on glazing by the system, and coatings for attenuating/modifying the color of the glazing in reflection. The present claims **do** particularly point out and distinctly claim the subject matter which Applicants regard as their invention, since Applicants do not regard their invention as limited to particular electrically controllable systems with particular coatings for adjusting the optical appearance conferred on the glazing by the system, and particular coatings for attenuating/modifying the color of the glazing in reflection, for example. Applicants note *Ex Parte Slob*, 157 USPQ 172 (Bd. App. 1967) cited by the Examiner. It is believed that *Slob* has never been cited in any subsequently published case, and it is respectfully submitted that it has minimal precedential value today. To the extent the Examiner relies on *Slob* for the broad proposition that claiming components of a claimed invention in functional terms renders such claims indefinite, this is not the law today and indeed, if it was, thousands of existing patents would be invalid. Nevertheless, *Slob* can be distinguished herein based on the facts. Unlike in *Slob*, there is no allegation that various expressions in the claims read upon materials that could not possibly accomplish the purposes intended.

In the present Office Action, the Examiner finds that component (a) is not a functional limitation because it is not recited in "means-plus-function" format, i.e., it lacks the word "for". In response, "means-plus-function" is not the only way to recite a claim element in functional terms. For example, the term "corrosion inhibitor" is a recital, in functional terms, of a material that inhibits corrosion, and, together with similar "functional " terms, such as antioxidant, thickener, surfactant, etc., can be found in thousands of claims in valid patents. In addition, and as discussed above, *Slob* can be distinguished herein based on its facts, which the Examiner does not respond to.

For all the above reasons, it is respectfully requested that this rejection be withdrawn.

The rejection of Claims 16-17, 19-34 and 36-38 under 35 U.S.C. § 112, first paragraph, as failing to satisfy the enablement requirement therein, is respectfully traversed. The Examiner finds that the specification is not enabling for one skilled in the art to make the at least one coating for attenuating/modifying the color of the glazing in reflection, wherein the at least one coating acts to lower the C* saturation values in the (L, a*, b*) colorimetry system of the glazing in reflection. In response, the newly-submitted Anderson Declaration explains how to make a coating for attenuating/modifying the color of the glazing in reflection. Accordingly, it is respectfully requested that this rejection be withdrawn.

Submitted herewith is a Letter to Official Draftsman, in response to the Form PTO 948 requiring an amended formal drawing for Figure 1. Accordingly, it is respectfully requested that the requirement be withdrawn.

All of the presently pending claims in this application are now believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.

Norman F. Oblon
Attorney of Record
Registration No. 24,618

Harris A. Pitlick
Registration No. 38,779

22850

(703) 413-3000
Fax #: (703)413-2220
NFO:HAP:kst

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IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF:	:
Philippe BOIRE et al.	: Group Art Unit: 1775
SERIAL NO: 09/486,719	: Examiner: Piziali
FILED: August 2, 2000	:

FOR: GLAZING WITH OPTICAL AND/OR ENERGETIC PROPERTIES CAPABLE OF BEING ELECTRICALLY CONTROLLED

DECLARATION UNDER 37 CFR 1.132

SIR:

I, Charles Anderson, declare and state as follows:

1. I am a doctoral graduate in materials science from Rice University. I have been employed by Saint-Gobain Recherche in the thin film group for the last 14 year as a research scientist. Over this period, the majority of my work has been concerned with optical simulations of thin films. I have used commercial software and have even written software for this purpose.

2. I am familiar with the claims, and have read the Office Action mailed December 18, 2002, in the above-identified application.

3. In order to make a coating for attenuating/modifying the color of the glazing in reflection, we procede as follows :

If we know the dispersion function (measured by spectroscopic ellipsometry) and thickness of a film we can calculate the changes of the reflected and transmitted amplitudes of the electric and magnetic fields impinging on the film using the following transfer matrix

$$\begin{bmatrix} E_a \\ H_a \end{bmatrix} = \begin{bmatrix} \cos\delta & (i\sin\delta)/\eta_1 \\ i\eta_1\sin\delta & \cos\delta \end{bmatrix} \begin{bmatrix} E_b \\ H_b \end{bmatrix}$$

where delta = 2 * pi * n(wavelength) * thickness / wavelength
and E_a, H_a are the electric and magnetic fields on one side of the film and E_b, H_b are the electric and magnetic fields on the other side

For multiple films the change of the amplitudes of the electric and magnetic fields are just the product of the individual matrices.

The transmission and reflection Poynting vectors can then be calculated from the transmitted and reflected amplitudes for each wavelength and the total reflection and transmission intensities for each wavelength can then be determined as just the ratios of the squares of the respective amplitudes and the square the incident amplitude.

The visible transmission and reflection spectra are just the results of these calculations over the wavelength between 380 nm and 780 nm. With these spectra the colors on transmission and reflection can then be determined using calculations described in document CIE 15.2 - 1986.

Optimization routines exist that allow modifying film thickness to obtain desired optical properties (color) on transmission and reflection for film stacks.

An example of knowledge of one skilled in this art will be found at

http://www.ist.fraunhofer.de/english/products/gf2/optical/simulation/frames.html

4. The undersigned declares further that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of this application or any patent issuing thereon.

5. Further declarant saith not.

May 12, 2003

C Ch